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ABSTRACT

Two studies explore the late outcome of minimal brain dysfunction in 73 patients in relation to their initial presentation and predictive factors. Both studies followed the patients for a period of 10 to 20 years. Findings from the first study of initial presentation in relation to adult outcome showed that there was a strong positive correlation between the childhood symptom of social problems and adult inadequate personality, between childhood anti-social behavior and adult personality disorder of the anti-social, passive-aggressive, and impulsive types. Negative correlations were found between childhood hyperactivity and school problem, and a normal psychiatric outcome. In study 2, by a variety of objective and subjective measurements, 20% were judged to have a satisfactory and 80% an unsatisfactory outcome. Findings showed that initail presentation was significantly correlated with a poor outcome in the following respects: multiplicity of behavioral symptoms, multiplicity of neuro-psychological soft signs, low average or borderline intelligence, learning disabilities (especially math and spelling), and special class placement. Initial diagnosis of clearcut organic brain syndrome also carried a poor prognosis, as did schizoid traits in childhood. Treatment, including psychotherapy, medication, remedial tutoring, and special schooling, did not have a differential effect on outcome. (Author/PHR)

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Minimal Brain Dysfunction in Childhood: II.* Late Outcome in Relation to Initial Presentation, III.** Predictive Factors in Relation to Late Outcome.

by

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* Presented at the American Pediatric Society, April 1978

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ABSTRACT

Seventy-three patients, diagnosed in childhood as having minimal brain dysfunction syndrome were followed for a period of 10 to 20 years to determine late outcome, in particular the fate of specific childhood symptoms, and the comparison between those with initial features of developmental lag and those with more clearcut evidence of organic brain syndrome. Symptomatically, there was a strong positive correlation between the childhood symptom of social problem and adult inadequate personality, between childhood anxiety and adult anxiety, between childhood anti-social behavior and adult personality disorder of the anti-social, passive-aggressive, and impulsive types. Negative correlations were found between childhood hyperactivity and school problem, and a normal psychiatric outcome. An initial diagnosis of developmental lag was associated with an outcome diagnosis of passive-aggressive personality, anti-social personality, depressive symptoms, and a satisfactory global outcome. An initial diagnosis of organic brain syndrome was associated in adulthood with organic brain syndrome, and with personality disorders of the inadequate, schizoid, and paranoid types, as well as with an unsatisfactory global outcome. Thus, the childhood presentation was significantly related to outcome, with interesting differences and polarities and very little overlap.

INTRODUCTION

Late outcome of the minimal brain dysfunction syndrome has been a subject of interest for many years, beginning with the recognition by Pasamanick et al.[1] of a relationship between perinatal pathology and behavioral maladjustment, and gaining added impetus from the 25-year follow-up studies of Menkes et al.[2] Susequent studies[3-9] pursued the question of outcome in various ways, each with particular limitations based upon the design of the study or the nature of the population studied.

The current study was undertaken to exploit the advantage this author had of being able to follow the same patients, originally seen and diagnosed by her, over a period of 10 to 20 years. The purpose of the study was to determine the following: 1. the consequences for adult adjustment of the childhood syndrome of minimal brain dysfunction; 2. the residua beyond the childhood years; 3. adult manifestations and symptoms; 4. the fate of specific childhood symptoms; 5. whether those diagnosed as maturational lag differed in outcome from those diagnosed as organic brain syndrome; and 6. significant factors affecting global outcome. A previous publication deals with the first three of these issues,[10] the current publication with the next two. The last issue will be the subject of a subsequent publication.

METHODS

The method has been described in detail elsewhere. In brief, 73 patients drawn from private practice, all referred by pediatricians, psychiatrists, psychologists, or school personnel, were seen initially

for diagnostic evaluation and were followed over a period of years either for continuing treatment, intermittent treatment, or monitoring of progress All initial and final evaluations were made by the author and were based on history, psychiatric interview, psychological testing, and examination by other specialists where indicated. All patients received continuing care appropriate to their needs and changing circumstances throughout the period of observation, including psychotherapy, pharmacotherapy, remedial education, special schooling, and hospitalization.

The initial diagnosis of minimal brain dysfunction was based upon a constellation of behavioral and clinical findings as defined by the task force of the National Institute of Neurological Disorders and Stroke[11], exerpted as follows: "children of near average, average, or above average general intelligence with certain learning or behavioral disabilities ranging from mild to severe, which are associated with deviations of function of the central nervous system. These deviations may manifest themselves by various combinations of impairment in perception, conceptualization, language, memory, and control of attention, impulse, or function. These aberrations may arise from genetic variations, biochemical irregularities, perinatal brain insults, or other illnesses or injuries." Final diagnoses were based generally on criteria defined in DSM II[12].

The findings were tabulated, cross tabulations were made of selected variables, and these were subjected to statistical analysis by chi square or Fisher's exact probability test in accordance with statistical indications.

RESULTS

The demography of the sample, the initial clinical features, and the psychiatric features at follow-up have been dealt with in a previous publication[10].

Initially the children were assigned a primary diagnosis of either developmental lag (38%) or organic brain syndrome (62%). The former category was reserved for those in whom maturational problems seemed to predominate, with lags in speech and motor development and fine coordination being prominent clinical findings. In this group I.Q. scores were higher and neurological and psychological soft signs fewer or less prominent (Table 1). Conversely, those with organic brain syndrome had lower I.Q. scores and more clearcut neurological and psychological soft signs. A greater proportion of organic patients had abnormal electroencephalograms and minor physical stigmata. Likewise they required significantly more special schooling. Also they were significantly more prone to receive secondary diagnoses of language impairment and schizoid traits.

The outcome of initial symptoms was examined with respect to significant positive and negative correlations (Table 2). It was found that, except for delayed speech, delayed motor development, and tantrums and aggression, all other presenting symptoms showed trends or significant correlations with regard to final diagnoses or final symptomatology. Those presenting symptoms that had the highest correlation with psychopathological findings at outcome were school problem, childhood social problem, childhood anxiety, and childhood anti-social behavior. Hyperactivity and school problem had a

negative association with a normal outcome.

A comparison of initial primary diagnostic categories and late outcome showed many significant positive correlations (Table 3). Although there was no correlation with a psychiatrically normal outcome, there was a positive correlation between the initial diagnosis of developmental lag and a final diagnosis of personality disorder of the passive-aggressive and anti-social types. The initial diagnosis of organic brain syndrome correlated with other types of personality disorder, namely inadequate, schizoid, and paranoid personality. As might be expected, a strong correlation existed between the initial and final diagnosis of organic brain syndrome. Although not statistically significant, the correlation between initial diagnosis of organic brain syndrome and final diagnosis of borderline psychosis was noteworthy. Depression, associated with developmental lag, and anxiety, associated with organic brain syndrome, were the only symptoms at follow-up that bore a clear relationship to the initial primary diagnostic category. Most interestingly, the initial diagnosis of developmental lag correlated significantly with a global outcome of satisfactory adjustment, while organic brain syndrome correlated with an unsatisfactory adjustment.

With regard to secondary initial diagnoses, initial schizoid traits and learning disability bore significant relationships to outcome diagnoses and symptoms (Table 3). Again, there were interesting polarities and virtually no overlap between these initial diagnoses and psychiatric outcome. Schizoid traits in childhood were significantly related to borderline mental retardation, schizoid personality, obsessive symptoms, and tic. Learning disability remained in a significant

percentage of individuals and also correlated with subsequent inadequate personality.

DISCUSSION

Whether the late outcome of childhood minimal brain dysfunction is viewed as benign or malignant depends upon many factors, including the investigator, the sampling method, the duration of the follow-up, the type of final clinical evaluation, and whether the design is prospective or retrospective. Mendelson et al[4] followed 83 hyperactive children for two to five years and found 55% of them to have improved and 35% to be unchanged or worse. Menkes et al[2] studied 18 patients retrospectively after 25 years and found eight (32%) to have become self-sustaining, while four (16%) in their series were institutionalized and psychotic. Weiss, et al[5] in a four year follow-up study, found much psychopathology, manifested by immaturity, friendlessness, anti-social trends. Investigators who looked at disturbed adults from the point of view of antecedent childhood history found much to confirm their contention that a variety of adult psychopathological syndromes, including schizophrenia[13, 14] and personality disorders[13, 15-20] have their origin in childhood minimal brain dysfunction syndrome. At the other end of the prognostic spectrum, others[1,2] see a diminution in symptoms and a favorable outcome.

The results of the current study bear out the less optimistic view, namely that the consequences are permanent and unfavorable.

With respect to the fate of specific symptoms, those initial symptoms which were clearly related to outcome were school problems, immaturity, social problems, fearfulness and anxiety, and anti-social behavior. Since they correlated with such disabling outcome features as personality disorder and its various sub-groups, as well as depression, anxiety, obsessionalism, and tics, these initial symptoms were of considerable prognostic significance. Moreover, the initial symptoms of anxiety and anti-social behavior persisted into adult life virtually unaltered. Early school problems foreshadowed a permanent learning disability despite the full range of remedial measures which were extended to all of these children. Furthermore, the presenting symptom of school problem strongly correlated with later personality disorder, hence must be viewed as of serious prognostic significance. Likewise, childhood hyperactivity was negatively correlated with a normal outcome and, therefore, an important indicator. Only delayed development of speech and motor functions and aggressive behavior had no clear correlation with outcome. This is not to say that these symptoms in childhood are of no significance; only that they do not discriminate between one or another form of pathological outcome.

The literature offers very little material for comparison in regard to late outcome of early symptoms. Koppitz[3], in a five year follow-up study of pupils with learning disability, found that an early history of delayed development was not related to outcome. Shaffer[22] concluded that there was no specific behavioral syndrome that was consistently associated with minimal brain dysfunction. The

disappearance of hyperactivity and its lack of specificity with regard to sequelae, confirmed here, is perhaps the reason for others'[1,2] findings of spontaneous improvement[1,2].

Did the initial diagnosis of developmental lag, based upon a more benign presentation, have a more benign prognosis? The answer depends upon whether an outcome of passive-aggressive or anti-social personality is deemed more benign than borderline psychosis or inadequate, schizoid, or paranoid types of personality disorder. From the point of view of social adjustment and independent living, the latter types of pathology, the ones associated with organic brain syndrome, are clearly more disabling. Moreover, the global rating of satisfactory adjustment was more often associated with the original diagnosis of lag, in contrast to unsatisfactory adjustment associated with organic brain syndrome. Thus the initial clinical distinction between lag and organicity would appear to be valid, not only in terms of severity of initial presentation, but also in terms of qualitatively different adaptive patterns and global outcome.

Again, the literature offers no parallel studies for comparison. Chess and Rosenberg[23], in a study of children presenting initially with language disorder, made a distinction between cerebral dysfunction and developmental lag. They found variable outcomes from normal to poor but gave no data regarding the relationship between intial and final diagnoses.

One can conclude that the initial presentation is highly significant in foreshadowing outcome. First, certain symptoms and problems, such

anxiety, anti-social behavior, school problems, and social problems endure and have specific outcomes both symptomatically and in personality types. Second, the more unequivocal the initial clinical picture of organicity, the poorer the outlook. Third, learning disability is an important prognostic indicator of disabling residua. And finally, the differentiation initially between developmental lag and organic brain syndrome is valid in that the two have different outcomes with little over-lap either symptomatically or in personality types.

The author acknowledges with appreciation the services of Mr. Anthony Babich, Clinical Assistant Professor, Computer Science Center, who performed the statistical analyses, and Mrs. Joyce Robinson who provided secretarial assistance.

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Table 1.
Relationship Between Initial Presentation and Initial Diagnostic Categories

Initial symptoms	Number	Maturational Lag (N=28=38%) Percent	Organic Brain Syndrome (N=45=62%) Percent	P value
Hyperactivity	49	79	60	.17
Anti-social behavior	13	32	9	.03
Fears, anxiety	40	32	69	.005
Immaturity, dependency	45	50	69	.17
Initial psycho-neurological findings				
Intelligence				
Above	14	46	2	.0000
Average	33	43	47	.0000
Below average	12	11	20	.0000
Borderline	14	0	31	.0000
Thinking problem	63	75	93	.06
Psychological soft signs	71	93	100	.28
Neurological soft signs	69	86	100	.03

(continued on next page)

Table 1
Relationship Between Initial Presentation and Initial Diagnostic Categories

	Number	Maturational Lag (N=28=38%) Percent	Organic Brain Syndrome (N=45=62%) Percent	P value
Initial physical findings				
Physical stigmata	44	46	69	.10
EEG abnormal	13	7	24	.12
Initial academic findings				
Regular class	49	86	56	.02
Special class	45	43	73	.02
Retarded spelling	27	14	51	.004
Secondary initial diagnoses				
Language impairment	49	50	78	.03
Schizoid features	23	7	47	.001
Learning disability	67	86	96	.29

(continuation of Table 1.)

Table 2. Outcome of Initial Symptoms

Childhood Symptoms	Psychiatric Outcome: Positive Correlations	%	P value	Negative Correlations	%	P value
School problem (61)	Learning disability (49)	92	.02	No psychiatric disorder (5)	40	.04
	Personality disorder (58)	91	.002			
	Passive-aggressive personality(29)	93	.14			
Hyperactivity (49)	Obsessive traits (7)	100	.13	No psychiatric disorder (5)	20	.07
				Anxiety (25)	48	.03
Immaturity, dependency (45)	Organic brain syndrome (42)	71	.08			
	Inadequate personality (36)	72	.11			
	Schizoid personality (32)	72	.18			
Social problem (41)	Anxiety (25)	84	.0008			
	Obsessiveness (7)	86	.18			
	Tics (5)	100	.10			
Anti-social behavior (13)	Anti-social personality (10)	60	.001	Schizoid personality (32)	6	.05
	Passive-aggressive personality (29)	35	.007			
				Anxiety (25)	0	.01
	Impulsive personality (12)	42	.05			

Numbers in parentheses refer to absolute numbers of cases.

Percents refer to precent of patients with the diagnosis or trait.

Table 3. Outcome Relative to Initial Diagnoses

Initial Diagnosis	Psychiatric Outcome Positive Correlations	%	P value
Developmental lag (28)	Passive-aggressive personality (29)	62	.002
	Anti-social personality (10)	70	.06
	Depressive symptoms (7)	86	.02
	Global outcome satisfactory (15)	67	.03
Organic brain syndrome (47)	Organic brain syndrome (42)	79	.001
	Inadequate personality (36)	75	.04
	Schizoid personality (32)	91	.000
	Paranoid personality (11)	91	.08
	Borderline psychosis (10)	80	.35
	Anxiety (25)	76	.12
	Adult social problem (48)	69	.09
	Global outcome satisfactory (58)	69	.03

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Table 3. Outcome Relative to Initial Diagnoses

Initial Diagnosis	Psychiatric Outcome					
	Positive Correlations	%	P value	Negative Correlations	%	P value
Schizoid features (23)	Organic brain syndrome (42)	74	.10	Passive-aggressive personality (29)	52	.004
	Borderline mental retardation (14)	35	.05			
	Schizoid personality (32)	78	.002	Anti-social personality (10)	20	.05
	Obsessive symptoms (7)	22	.05			
	Tics (5)	13	.05			
Learning disability (67)	Learning disability (49)	72	.02	No psychiatric disorder (5)	33	.07
	Inadequate personality (36)	54	.04			

(continuation of Table 3.)

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Minimal Brain Dysfunction Syndrome in Childhood: III. Predictive Factors in Relation to Late Outcome

by

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Presented at the New York Pediatric Society, March 1978

ABSTRACT

Seventy-three patients, diagnosed in childhood as having minimal brain dysfunction, were followed for a period of 10 to 20 years to determine late outcome. By a variety of objective and subjective measurements 20% were judged to have a satisfactory and 80% an unsatisfactory outcome. Initial presentation was significantly correlated with a poor outcome in the following respects: multiplicity of behavioral symptoms, multiplicity of neuro-psychological soft signs, low average or borderline intelligence, learning disabilities (especially math and spelling), and special class placement. Initial diagnosis of clearcut organic brain syndrome also carried a poor prognosis, as did schizoid traits in childhood. Treatment, including psychotherapy, medication, remedial tutoring, and special schooling, did not have a differential effect on outcome. The significance of identifying early indicators, apart from aiding in individual prognosis, is that they may offer more refined means of evaluating the effects of intervention.

INTRODUCTION

The current study of late outcome of minimal brain dysfunction was inspired by the disparate reports of others concerning outcome [1-9], the recent recognition by adult psychiatrists that certain adult disorders seem to have their origins in the same childhood syndrome, and the author's opportunity to follow her own patients over a span of ten to twenty years.

Previous communications dealt with descriptive features and diagnostic findings at outcome [10], the fate of specific childhood symptoms [11], and correlations between initial presentation and outcome [11]. This communication is concerned with predictive factors in the initial childhood presentation.

METHOD

The method has been described in detail elsewhere [10]. Briefly, the subjects were 73 patients seen by the author in private practice, all having been referred by pediatricians, psychiatrists, psychologists or educators. All initial and final diagnostic evaluations were made by the author and were supplemented by other specialist examinations where indicated. All patients were followed at intervals either therapeutically for for the purpose of monitoring progress. All patients received a variety of treatment modalities appropriate to their specific needs and changing circumstances, including psychotherapy, medication, remedial tutoring, special schooling, and hospitalization.

The initial diagnosis of minimal brain dysfunction was based on a constellation of behavioral and clinical findings as defined by the task force of the National Institute of Neurological Disorders and Stroke[12], exerpted as follows: "children of near average, average, or above average general intelligence with certain learning or behavioral disabilities ranging from mild to severe, which are associated with deviations of function of the central nervous system. These deviations may manifest themselves by various combinations of impairment in perception, conceptualization, language, memory, and control of attention, impulse, or function. These aberrations may arise from genetic variations, biochemical irregularities, perinatal brain insults, or other illnesses or injuries." Final diagnoses were based generally on criteria in DSM II[13].

A detailed record was compiled of each patient's presenting symptomatology, family history, birth history, early development, psycho-neurological examination, physical and laboratory findings, and educational, social, and psychiatric course. The data were subjected to statistical analysis, using the chi square test for statistical significance. Although the report focuses primarily on clinically important trends and statistically significant correlations, certain of the interesting null correlations have been included for completeness.

RESULTS

Global outcome was a final evaluation arrived at on the basis of certain objective data gathered separately from the parents and the patients, plus the parents' and the patients' subjective assessment,

plus the examiner's assessment. Included in objective data were the following: school achievement relative to intellectual potential, employment status (sheltered or independent, part-time or full-time, sustained or sporadic), living arrangements (independent, with parents, or in residential care), peer relationships, relationships with employers or teachers, relationships with family, relationships with the opposite sex (dating, engaged, married), and need for psychiatric care (Table I).

Parents were asked to make their own global evaluation which was then classified as excellent, good, marginal, or poor. These four categories were then combined into two, satisfactory and unsatisfactory, because in many instances where repeated evaluations were made, there was movement back and forth between one classification and another in response to changing life circumstances (e.g. loss of a job, a broken engagement, dropping out of college). The patients' subjective assessments were based in large measure on their school and work achievement, their feelings regarding adequacy or self-confidence, their sense of their parents' approval, and the presence or absence of such symptoms as anxiety or depression. The examiner drew on all of the foregoing, arriving at a global rating not significantly different from that of the parents, ~~except In a few instances wherein~~ the author a parent's judgment of "good" ~~was viewed by this examiner as "marginal"~~, These ~~differences resulted from the examiner's anticipating continuing~~ or ~~increasing difficulties in the face of the complexities of adult life,~~

Demographic features such as sex and socio-economic class showed no statistically significant correlation with outcome although there was a trend toward a poorer outcome for females and for those of lower socio-economic class (Table 2). Among the various presenting symptoms, school problem, hyperactivity, tantrums and aggression, and immaturity likewise showed an association with a poorer outcome, again without statistical significance.

Initial psycho-neurological abnormalities were generally associated with a negative outcome, but only neurological impairment and low intelligence were of statistical significance. Initial stigmatizing history and physical stigmata showed no correlation with outcome but abnormal chromosomes and abnormal EEG did show a trend.

In order to determine whether these initial findings had an additive effect, a further statistical analysis was done correlating numbers of related findings with outcome. By this analysis it was found that greater numbers of related findings did indeed affect outcome to a statistically significant degree, leading to the concept that severity could be quantitated by numbers of presenting findings.

Early scholastic adjustment was of the same order of statistical significance as general intelligence and as clusters of symptoms (Table 3). It is of interest that mathematical and spelling disabilities appeared to have a high degree of predictive value, even greater than that of reading. The ability to function in a regular class, and conversely the need for a special class, correlated strongly and divergently, a finding consistent with the effects of intelligence and of specific learning disabilities.

Initial diagnostic classification, although it preceded outcome by ten to twenty years, bore a strong correlation with global adjustment (Table 4). The primary diagnostic category of maturational lag, applied to those with fewer or less clearcut neurological findings, and that of organic brain syndrome, applied to those with more clearcut neurological findings including abnormal electroencephalographic findings, clearly foreshadowed a better or a poorer outcome. It is noteworthy that among secondary diagnoses, schizoid traits in childhood carried a very poor prognisis. These findings have been dealt with at length in a prior communication[11].

In addition to the factors listed (Table 1) that were of no statistical significance, many others were found to lack correlation with outcome, namely poor social relationships, delayed motor and speech development, fears and anxiety, anti-social behavior, broken home or adoption, and types of therapy. It is not to be inferred that these factors were of no clinical significance, merely that individually they did not differentially affect outcome.

DISCUSSION

Many investigators have attempted to deal with the question of late outcome of the childhood syndrome of minimal brain dysfunction[2-7]. Views have varied, depending upon the design of the study, some finding optimism and some pessimism from the same point of departure[1,4,5,14,15,16]. Predictors have been harder to come by than qualitative descriptions of outcome. In fact, some have concluded that there is no way to determine outcome[3,17].

This study, then, can claim to agree with those who find no evidence that any specific intervention has a clear effect on outcome. On the other hand, it does indicate that certain early findings are useful prognosticators.

Among the initial findings, intelligence is an unequivocal indicator, with a linear relationship between level of intelligence and outcome. Not only does general intelligence function as an independent positive force for effective adaptation, but it is significant for educational attainment which in turn is another indicator of a successful outcome.

Beyond the unsurprising finding that intelligence is an important determinant of outcome, it is of interest to note that the die is cast at an early age. Perhaps this is the reason that intervention has little discernible effect, since it does nothing to alter basic intellectual endowment. A concordant interpretation, then, should be given to the association between the need for special class placement and a poor outcome. That is, the child who requires a special class is already in an unfavorable situation which remedial education will not entirely overcome. This is not to say that remediation is of no value; in fact, without it, the outcome conceivably would be a lot worse. Conversely, the child who does not receive special education turns out more favorably not for lack of special attention, but rather because his intellectual strengths are such that he can compensate without it.

Another significant prognostic indicator is the presence of clearcut evidence of neurological impairment. Since it is this type of evidence that makes for the initial differentiation of organic

brain syndrome from developmental lag, either the neurological findings or the designation of organicity simply underscores the fact that a more serious clinical picture at the outset leads to a poorer outcome. In this respect our findings are the reverse of those of Satterfield et al who observed no correlation between an abnormal electroencephalogram and a poorer prognosis[18].

Another way to approach the issue of severity is to look for multiplicity of presenting findings, and, indeed, this approach yielded valuable prognostic information. Again, it would appear that if the early problems were multiple, whether symptomatic, physical, or neuro-psychological, the outlook was poorer.

Thus, this study provides the clinician who makes an early diagnosis with some guidelines for prognosis. Female sex, lower social class, multiple behavioral symptoms, lower intelligence, more pronounced neurological findings, multiple neuro-psychological soft signs, and learning disabilities suggest a poorer prognosis. Conversely, male sex, higher social class, milder symptomatology, better intelligence, all qualities that facilitate adaptation, make for a better outcome. In addition to the usefulness of these indicators for individual prognosis, they have a potential application in assessing the value of remedial measures. Although current measures of outcome fail to discriminate among various treatment modalities, it is conceivable that with the use of more refined predictors, one could isolate factors capable of modifying the expected outcome.

The author acknowledges with appreciation the services of Mr. Anthony Babich, Clinical Assistant Professor, Computer Science Center, who performed the statistical analyses, and Mrs. Joyce Robinson who provided secretarial assistance.

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Table I. Late Outcome

	Number	Percent
Educational attainment		
High school		
Academic diploma	10	14
General diploma	51	70
Drop-out	12	16
College		
Student	7	10
Graduate	2	3
Drop-out	11	15
Not enrolled	53	73
Vocational education	18	25
Employment		
Independent	26	36
Sheltered	13	18
Social adjustment		
Dating	15	21
Engaged	3	4
Married	2	3
Socialization problem	49	67

(continued next page)

Table 1. Late Outcome

	Number	Percent
Current status		
Student	35	48
Employed full-time	22	30
Inactive at home	12	16
Residental care	4	5
Parents' assessment		
Good	5	7
Satisfactory	15	21
Marginal	39	53
Poor	14	19
Global evaluation		
Good	6	8
Satisfactory	9	12
Marginal	45	62
Poor	13	18

(continuation of Table 1)

Table 2. Global Outcome Correlated with Initial Presentation (in percent*)

	Satisfactory (N=15=20%)	Unsatisfactory (N=58=80%)	P
Demographic features			
Sex			
Male (58)	87	78	.68
Female (15)	13	22	
Socio-economic class			
I,II (25)	60	45	.45
III (38)	40	55	
Symptoms			
School problem (61)	67	88	.11
Hyperactivity (49)	53	71	.33
Tantrums, aggression (44)	47	64	.36
Immaturity, dependency (45)	47	66	.30
Physical findings			
Perinatal pathology (56)	79	77	.91
Physical stigmata (44)	60	60	.79
EEG abnormal (13)	7	21	.38
Chromosomes abnormal (3)	0	5	.40
Neuro-psychological findings			
Psychological abnormalities (71)	93	98	.88
Neurological abnormalities (69)	80	98	.02
Thinking impairment (63)	7	21	.38
Language impairment (57)	60	83	.12

(continued next page)

Numbers in parentheses are absolute numbers.

*Percentage referable to type of outcome.

Table 2. Global Outcome Correlated with Initial Presentation (in percent*)

	Satisfactory (N=15=20%)	Unsatisfactory (N=58=80)	P
Intelligence			
Above average (14)	40	14	.05
Average (33)	47	45	
Below average (12)	13	17	
Borderline (14)	0	24	
Multiplicity of findings			
Initial symptoms			
Two - four (23)	54	26	.03
Five - nine (50)	47	75	
Neuro-psychological abnormalities			
One - two (7)	27	5	.04
Three - four (66)	73	95	
Physical findings			
None - two (55)	87	74	.48
Three - four (17)	13	26	

*Percentage referable to type of outcome.

(continuation of Table 2)

Table 3. Global Outcome Correlated with Academic Achievement (in percent*)

	Satisfactory (N=15-20%)	Unsatisfactory (N=58-80%)	P
Learning disabilities			
Reading (59)	67	85	.23
Mathematics (44)	33	67	.04
Spelling (27)	7	45	.02
Class placement			
Regular class (49)	93	60	.03
Special class (45)	33	69	.03

*Percentage referable to type of outcome.

Table 4. Global Outcome Correlated with Initial Presentation (in present*)

	Satisfactory (N=15=20%)	Unsatisfactory (N=58=80%)	P
Initial diagnoses			
Primary			
Developmental lag (28)	67	31	.03
Organic brain syndrome (45)	33	69	
Secondary			
Learning disability (67)	80	95	.18
Schizoid traits (23)	0	40	.008
Borderline mental retardation (14)	0	24	.08

*Percentage referable to type outcome.